



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/581,497

06/02/2006

Babak Heidari

AOBDP0105US

3831

23908 7590 03/24/2011  
RENNER OTTO BOISSELLE & SKLAR, LLP  
1621 EUCLID AVENUE  
NINETEENTH FLOOR  
CLEVELAND, OH 44115

EXAMINER

BROWN II, DAVID N

ART UNIT

PAPER NUMBER

1743

MAIL DATE

DELIVERY MODE

03/24/2011

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/581,497	<b>Applicant(s)</b> HEIDARI ET AL.	
	<b>Examiner</b> DAVID N. BROWN II	<b>Art Unit</b> 1743	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 07 March 2011.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-6 and 8-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 8-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

This is a non final action in response to the RCE dated 03/07/2011.

#### ***Drawings***

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "108" has been used to designate both seal and cylinder. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.
2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "113" has been used to designate both seal and flexible membrane. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or

Art Unit: 1743

“New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-6, 8-9 and 12-14 are rejected under 35 U.S.C. 102(b) as being anticipated by US 6,482,742 (Chou).

Chou teaches an apparatus for transferring a pattern from a template (mold 10) to a substrate (28) carrying a radiation polymerizable fluid (21) with first part (10) and second main part (28+21+79) having opposing surfaces. The imprinting operation adjusts the spacing between the parts (imprinting; abstract). Support means (74 and 75) keep the parts in mutual parallel engagement. Chou teaches a radiation source (column 4 lines 27-31). The chamber labeled 73 has first walls comprising flexible membranes (o-ring 78, mold 10 taught to be flexible column 3 lines 34-36) The flexible membranes engage either the template or the substrate (column 6 lines 11-13). They are transparent (column 3 lines 3-8, column 4 lines 26-31); the radiation source is behind the membrane. Chou teaches a means for

Art Unit: 1743

applying an adjustable overpressure (column 5 line 65- column 6 line 3). In the embodiment shown in figure 7, the substrate is outside the pressurized cavity (73).

Claims 2-4:

Chou teaches the use of air at 500psi (35 bar). (column 6 line 27)

Claim 5:

Figures 6A and 6B show a cavity defined by a part of the surface of the first main part, a flexible seal member arranged in and protruding from the main part surface and the membrane engaging the seal member. The main parts are shown within the containers (having cavities therein). Part 60 is an evacuated plastic bag. Part 61 is a sealing clamp.

Claim 6:

The bag is cut off and the mold is separated from the substrate (column 6 lines 35-37). Under pressure, the mold is pressed into the PMMA (column 6 lines 30-31).

Claim 8:

One or both of the mold and the substrate are taught to be transparent. The mold is taken to be the first main part.

Claim 9:

See column 3 lines 6-8. This area of Chou describes the first main part as being made of quartz.

Claim 12:

Chou teaches the use of a plastic material (column 3 lines 16-17).

Art Unit: 1743

Claim 13:

Chou teaches the use of a 4" wafer (roughly 200mm). This wafer is the substrate, taken to be the membrane.

Claim 14:

The substrate described is flexible and transparent. It, according to the interpretation offered by the examiner, acts as the membrane. This has been mentioned above in the rejection of claim 1 where first part (10) and second main part (28+21+79) having opposing surfaces was described.

3. Claim 10 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over US 6,482,742 (Chou).

Chou is silent as to the wavelengths of radiation used. Chou teaches the use of UV radiation (column 4 lines 26-28). The UV range is from 10-400nm. Either Chou operates in the claimed radiation range or it would have been obvious to one having ordinary skill in the art at the time of the invention to operate within this range. Such wavelengths are suggested by Chou since Chou teaches operating in the UV range.

***Claim Rejections - 35 USC § 103***

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,482,742 (Chou) in view of US 4,095,113 (Wolff).

Chou teaches the use of UV radiation but is silent as to the device used to produce it. Wolff teaches a xenon lamp capable of operating with a pulse

Art Unit: 1743

duration of 0.5- 10 micro seconds and a pulse rate of 1-10 pulses per second. It would have been obvious to one having ordinary skill in the art at the time of the invention to use Wolfe's xenon lamp as a source of UV radiation for the invention of Chou. This amounts to combining prior art elements according to known methods.

6. Claims 1-3, 5, 6, 8, 10, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 4,312,823 (Kraakman) in view of US 2003/0159608 (Heidari).

Kraakman teaches an apparatus for transferring a pattern from a template (2) having a structured surface to a layer of a radiation polymerisable fluid (3), said apparatus comprising a first main part (10) and a second main part (1) having opposing surfaces, means for adjusting a spacing between said main parts (9), support means for supporting said template and substrate in mutual parallel engagement (6, 7) in said spacing with said structured surface facing said surface layer, a radiation source devised to emit radiation for solidifying said layer (17), into said spacing, a cavity having a first wall (16), the first wall comprising a flexible membrane (11) devised to engage either said template or said substrate, and means for applying an adjustable overpressure (15) to a medium present in said cavity wherein said membrane is transparent to a wavelength range of said radiation (column 3 lines 26-29), said radiation source being positioned behind said membrane (fig 3), and said substrate (11) being positioned outside of said pressurized cavity.

Art Unit: 1743

The device of Kraakman has the substrate (11) positioned on the first, top main part which does not carry a surface layer of radiation polymerizable fluid. The device of Heidari shown in figure 3 also shows an apparatus for transferring a pattern from a template (10) having a structured surface to a layer of a radiation polymerisable fluid, said apparatus comprising a first main part (1) and a second main part (3) having opposing surfaces, means for adjusting a spacing between said main parts (abstract), support means for supporting said template and substrate in mutual parallel engagement (abstract) in said spacing with said structured surface facing said surface layer, a radiation source devised to emit radiation for solidifying said layer [0053], into said spacing, a cavity having a first wall (6), the first wall comprising a flexible membrane (9) devised to engage either said template or said substrate, and means for applying an adjustable overpressure (12) to a medium present in said cavity and said substrate (5) being positioned outside of said pressurized cavity. Heidari shows two different arrangements of the device in figures 1 and 3. The arrangement of figure 1 has the substrate positioned on the top main part and the device in figure 3 has the substrate positioned on the bottom main part. Thus an artisan armed with the teachings of both Kraakman and Heidari would know that the device of Kraakman would still function if the top and bottom main parts were reversed, wherein the substrate would be positioned on the bottom. In this case, the substrate would be configured to carry a surface layer of radiation polymerizable fluid. It would have been obvious to one having ordinary skill in the art at the time



Art Unit: 1743

of the invention to reverse the positions of the top and bottom main parts as this is shown to be a simple substitution of known elements with retention of function.

Claim 2:

Kraakman teaches the use of a gas (abstract).

Claim 3:

Although Kraakman teaches the use of a gas it would have been obvious to one having ordinary skill in the art at the time of the invention that air would function as an equivalent.

Claim 5:

Kraakman teaches element 12 is a flexible collar (column 5 lines 14-16). It defines part of the cavity (16) and the membrane engages this seal member.

Claim 6:

The membrane (11) is disconnectable from the seal member (12) by release of the vacuum from (14).

Claim 8:

Kraakman teaches that the membrane is transparent to the radiation (column 3 lines 27-29) A portion of the first main part would necessarily have to be transparent to the radiation since Kraakman teaches the radiation source behind the membrane in figure 3.

Claim 10:

Kraakman teaches UV light of 350nm (column 6 line 4). This is understood to be 350 nm. (UV light of 350mm does not make sense.)

Claim 12:

Art Unit: 1743

Kraakman teaches that the membrane is made from plastic (column 3 lines 26-39).

7. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 2003/0159608 (Heidari) in view of US 4,312,823 (Kraakman).

Claim 1:

Heidari teaches an apparatus for transferring a pattern from a template (10) having a structured surface, said apparatus comprising a first main part (1) and a second main part (3) having opposing surfaces, means for adjusting a spacing between said main parts (abstract), support means for supporting said template and substrate in mutual parallel engagement (abstract) in said spacing with said structured surface facing said surface layer, a radiation source devised to emit radiation [0053], into said spacing, a cavity having a first wall (6), the first wall comprising a flexible membrane (9) devised to engage either said template or said substrate, and means for applying an adjustable overpressure (12) to a medium present in said cavity and said substrate (5) being positioned outside of said pressurized cavity.

Kraakman teaches an apparatus for transferring a pattern from a template (2) having a structured surface to a layer of a radiation polymerisable fluid (3), said apparatus comprising a first main part (10) and a second main part (1) having opposing surfaces, means for adjusting a spacing between said main parts (9), support means for supporting said template and substrate in mutual parallel engagement (6, 7) in said spacing with said structured surface facing said surface layer, a radiation source devised to emit radiation for solidifying said

Art Unit: 1743

layer (17), into said spacing, a cavity having a first wall (16), the first wall comprising a flexible membrane (11) devised to engage either said template or said substrate, and means for applying an adjustable overpressure (15) to a medium present in said cavity wherein said membrane is transparent to a wavelength range of said radiation (column 3 lines 26-29), said radiation source being positioned behind said membrane (fig 3), and said substrate (11) being positioned outside of said pressurized cavity.

Heidari does not teach that the membrane is transparent to a wavelength range of radiation but teaches that the membrane is made of plastic [0013]. Kraakman also teaches the use of a plastic membrane (column 3 lines 26-39) It would have been obvious to one having ordinary skill in the art at the time of the invention to form the membrane out of a material transparent to a wavelength range of radiation used in the curing process motivated by a desire to cure the medium with UV radiation (Kraakman, Id).

Heidari teaches using IR radiation to cure the material [0053]. Heidari teaches using PMMA [0041]. Kraakman teaches the use of a UV curable resin (abstract). PMMA is a known UV curable resin. It would have been obvious to one having ordinary skill in the art at the time of the invention to use a UV light (Kraakman column 6 lines 2-4). This is a substitution combination of prior art elements according to known methods.

Claims 2 and 3:

Heidari teaches the use of hydraulic fluid as a means for pressurizing the chamber [0044]. Kraakman teaches the use of gas (abstract; air is a known

Art Unit: 1743

equivalent to accomplish the same result). It would have been obvious to one having ordinary skill in the art at the time of the invention to substitute gas or air for the fluid taught by Heidari as these are art recognized equivalents for accomplishing the end of pressurizing the chamber.

Claim 4:

Heidari teaches a pressure of from 5-500 bar [0056]. "[ A ] prior art reference that discloses a range encompassing a somewhat narrower claimed range is sufficient to establish a prima facie case of obviousness." *In re Peterson*, 315 F.3d 1325, 1330, 65 USPQ2d 1379, 1382-83 (Fed. Cir. 2003).

### ***Response to Arguments***

8. Applicant's arguments filed 2/4/2011 have been fully considered but they are not persuasive.
9. Applicant's argument that Chow positions the substrate inside the cavity has been considered but it is not persuasive. The embodiment shown in figure 7 of Chou has the substrate positioned outside of the cavity.
10. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., the use of a pressurized chamber in Chou) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAVID N. BROWN II whose telephone number is (571)270-5497. The examiner can normally be reached on Monday-Thursday 7:30a-5:00p EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Del Sole can be reached on (571)-272-1130. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/DAVID N. BROWN II/  
Examiner, Art Unit 1743

/Joseph S. Del Sole/  
Supervisory Patent Examiner, Art Unit 1743